

WHAT IS CLAIMED IS:

1. An anode active material for a lithium secondary battery comprising a complex composed of ultra-fine Si phase particles and an oxide surrounding the Si phase particles, and a carbon material.

5 2. The anode active material according to claim 1, wherein the oxide comprises a material selected from the group consisting of Al, Ti, Zr, Nb, Cr, Fe, Li, Mn, Ni, Co, Sn, V, In, Y, Ge, Ta, Mg, Ca, Mo, Sb, P, B, N and mixtures of two or more thereof.

3. The anode active material according to claim 1, wherein the anode active material is surface-modified by coating it with a low crystalline or amorphous carbon
10 material.

4. An anode active material for a lithium secondary battery comprising a complex composed of Si phase particles and an oxide surrounding the Si phase particles.

5. A method for preparing an anode active material for a lithium secondary
15 battery comprising:

producing a complex composed of ultra-fine Si particles and an oxide surrounding the ultra-fine Si particles by mixing a silicon oxide and a material having an absolute value of oxide formation enthalpy (ΔH_{for}) greater than that of the silicon oxide and also a negative oxide formation enthalpy by a mechanochemical process or
20 subjecting them to a thermochemical reaction to reduce the silicon oxide; and

mixing the complex and carbon material.

6. The method according to claim 5, wherein the material having an absolute

value of oxide formation enthalpy (ΔH_{for}) greater than that of the silicon oxide and also a negative oxide formation enthalpy comprises material selected from the group consisting of Al, Ti, Zr, Nb, Cr, Fe, Li, Mn, Ni, Co, Sn, V, In, Y, Ge, Ta, Mg, Ca, Mo, Sb, P, B, Li_3N and mixtures of two or more thereof.

5 7. The method according to claim 5, further comprising:

ball milling the Si phase-containing oxide complex and carbon material to form a composite material.

8. The method according to claim 5, further comprising:

forming a composite material of the Si phase-containing oxide complex and
10 carbon material; and

coating the composite material with a low crystalline or amorphous carbon material.

9. The method according to claim 5, further comprising:

adding a lithium compound selected from the group consisting of Li_2O ,
15 Li_2O_2 , LiNO_3 , Li_2S and mixtures of two or more thereof, in the first step.

10. A method for preparing an anode active material for a lithium secondary battery comprising:

a process of producing a complex composed of ultra-fine Si particles and an oxide surrounding the ultra-fine Si particles by mixing a silicon oxide and a material
20 having an absolute value of oxide formation enthalpy (ΔH_{for}) greater than that of the silicon oxide and also a negative oxide formation enthalpy by a mechanochemical

process or subjecting them to a thermochemical reaction to reduce the silicon oxide.